IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Kulkarni, et al.	Attorney Docket No.: CISCP271/5126
Application No.: 10/084,698	Examiner: Abdullahi Elmi Salad
Filed: February 27, 2002	Group: 2157

Title: METHODS AND APPARATUS FOR
MOBILE IP HOME AGENT CLUSTERING

CERTIFICATE OF TRANSMISSION
I hereby certify that this correspondence is being transmitted via
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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant requests review of the final rejection in the above-identified application.

This request is being filed with a Notice of Appeal.

The review is requested for the reasons stated on the attached sheets.

Remarks begin on page 2 of this paper.

R E M A R K S

In the Office Action, the Examiner has rejected claims 1-9, 12-28 and 44-76 under 35 USC §103 as being unpatentable over Warrier et al., U.S. Patent No. 6,707,809, ('Warrier' hereinafter) in view of Haverinen et al, U.S. Patent Application Publication No. 2001/0021175 A1, ('Haverinen' hereinafter). This rejection is fully traversed below.

The claimed invention enables Mobile IP Home Agent clustering to be implemented. This is accomplished through intercepting and routing registration requests and replies via a main Home Agent that acts as a Home Agent cluster controller. In this manner, Mobile IP subscribers may be supported by multiple Home Agents, rather than a single, statically configured Home Agent. This may be desirable, for example, to perform load balancing.

For example, with respect to independent claim 1, a method of processing a registration request received from a Mobile Node is performed by a first one of a plurality of Home Agents. The first Home Agent receives a registration request addressed to a virtual Home Agent address associated with the plurality of Home Agents, and sends the registration request to a second one of the plurality of Home Agents. The first Home Agent creates a temporary binding between the Mobile Node and the Foreign Agent to which the Mobile Node has roamed. The temporary binding is updated to create a permanent binding when the registration reply is received from the second Home Agent.

Warrier fails to disclose or suggest "creating a temporary binding by the first one of the plurality of Home Agents between the Mobile Node and the Foreign Agent" or "updating the temporary binding by the first one of the plurality of Home Agents to create a permanent binding when the registration reply is received from the second one of the plurality of Home Agents." In fact, steps 56 and 60 of col. 6 and step 64 of col. 6 are performed at two different entities. In no manner does Warrier disclose or suggest creating a temporary binding that is later updated. Rather, Warrier simply discloses creating a mobility binding record at two different entities, the Home Agent Control Node and the Home Agent.

The Examiner admits that Warrier is silent regarding "receiving a registration request addressed to a virtual Home Agent address associated with the plurality of Home Agents," "creating a temporary binding by the first one of the plurality of Home Agents between the Mobile Node and the Foreign Agent," and "updating the temporary binding by the first one of

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the plurality of Home Agents to create a permanent binding when the registration reply is received from the second one of the plurality of Home Agents." The Examiner seeks to cure the deficiencies of Warrier with Haverinen.

Haverinen discloses a method for load balancing in a telecommunications system supporting Mobile IP. A single home agent acts as the primary home agent. Packets destined for a mobile node may be transmitted via one or more secondary home agents. See Abstract.

The registration request that is received by the primary home agent of Haverinen is addressed to the primary home agent. In other words, the registration request is not addressed to a virtual home agent address. Rather, the primary home agent advertises its presence by sending advertisement messages. See paragraph 0022. The mobile node can also send an agent solicitation in order to find out the possible agents in the network. See paragraph 0023. Once the mobile node obtains the address of the primary home agent, the mobile node sends a registration request including the address of the primary home agent. See paragraph 0026. Accordingly, Applicant respectfully submits that Haverinen fails to disclose or suggest "receiving a registration request addressed to a virtual Home Agent address associated with the plurality of Home Agents."

Since the invention of claim 1 enables a mobile node to send a registration request to a virtual home agent address, the mobile node need not send an agent solicitation or obtain the address of a primary home agent. Moreover, it is possible to replace the primary home agent with another home agent without requiring the mobile node to obtain the identity of the new primary home agent. As a result, the claimed invention enables a registration request to be transmitted with minimal processing on the behalf of the mobile node. In addition, the claimed invention eliminates the risk that the mobile node will send a registration request to a home agent that is no longer acting as the primary home agent.

Once the primary home agent of Haverinen processes the registration request, it sends a routing request (Start Forwarding) to the secondary home agent. See paragraph 0027. Upon receiving the routing request, the secondary home agent maintains mobility bindings according to messages received from the primary home agent. For instance, the home addresses and lifetimes of the mobile nodes to be served are stored. See paragraph 0029. When the secondary home agent acknowledges that it can transmit packets, the primary home agent can accept the registration request and update its care-of address list. See paragraph 0030. The primary home agent of Haverinen generates and sends a registration reply. As such, Haverinen teaches away from another home agent generating a registration reply.

The registration request of Haverinen is not forwarded to the secondary home agent. As a result, a registration reply is not received from the secondary Home Agent. It follows that the care-of address list is not subsequently updated when a registration reply is received from the secondary home agent. Accordingly, Applicant respectfully submits that Haverinen fails to disclose or suggest "updating the temporary binding by the first one of the plurality of Home Agents to create a permanent binding when the registration reply is received from the second one of the plurality of Home Agents."

Since the secondary home agent of Haverinen merely acknowledges the routing request to indicate that it can forward packets, the secondary home agent that will be handling the data packets has no control over the terms of the Mobile IP session such as the registration lifetime assigned to the mobile node. In contrast, the claimed invention enables the secondary home agent to control the terms of the Mobile IP session by providing information such as the registration lifetime of the mobile node in the registration reply. The primary home agent then updates its temporary binding with information received in the registration reply. For instance, the invention of claims 6 and 7 enable the secondary home agent to specify a lifetime to be assigned to the mobile node in the registration reply. Since the combination of Warrier and Haverinen would fail to yield the advantages of the claimed invention, the combination of Warrier and Haverinen would fail to achieve the desired result. Accordingly, Applicant respectfully submits that claim 1 is patentable over the cited references.

With respect to claims 10-11, the Examiner has rejected claims 10-11 over Warrier and Haverinen, and further in view of Johansson, U.S. Patent Application Publication No. 2002/0080752, ('Johansson' hereainafter).
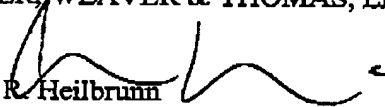
Johansson fails to cure the deficiencies of Warrier and Haverinen. While Johansson does disclose the use of a virtual home agent, the home agents are connected solely for redundancy purposes. Thus, data is transmitted by a primary to a backup home agent via the virtual router redundancy protocol (VRRP). In other words, the backup home agent is updated with registrations received by the primary home agent via the VRRP. See paragraph 0142. It would therefore be unnecessary for a Home Agent that is not processing registration requests to intercept registration requests. As such, Johansson teaches away from intercepting registration requests by a Home Agent that will not be servicing the request.

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In addition, paragraph 0086 of Johansson cited by the Examiner fails to disclose or suggest specifying a destination MAC address equal to a MAC address assigned to either the second or first Home Agent in the registration request, as recited in claims 10-11, respectively. Rather, paragraph 0086 of Johansson merely discusses forwarding traffic destined for a mobile node based upon the IP address and MAC address of the mobile node. As such, the combination of the cited references would fail to achieve the desired result. Accordingly, Applicant respectfully submits that claims 10-11 are patentable over the cited references.

The dependent claims depend from one of the independent claims and are therefore patentable for at least the same reasons. However, the dependent claims recite additional limitations that further distinguish them from the cited references. The additional limitations recited in the independent claims or the dependent claims are not further discussed, as the above discussed limitations are clearly sufficient to distinguish the claimed invention from the cited references. Thus, Applicant respectfully submits that the claims are patentable over the cited references.

Respectfully submitted,

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